Sports participation and body concern in an adult population: Does type of sport matter?

Examination number: 6325840
MSc Psychology of Individual Differences
The University of Edinburgh
2011

TABLE OF CONTENTS

Acknowledgements

I would like to thank my supervisor, Dr Alex Weiss, for supporting and allowing me independence. Further thanks to my friends within the department at Edinburgh for their statistics help and for fuelling my interest my Psychology and Individual Differences with lively debates.

I have been very lucky, throughout my MSc year, to have the constant support and companionship of my friends, who have advised me on everything from statistics to fonts. I will always be grateful for their help and friendship. I would also like to thank my family, near and far, mainly for their patience when I have been an irritable, tired version of my usual self.

I would also like to thank every one of my participants and everyone who helped me to recruit them, there would be no thesis without them.

Abstract

Body image is a human universal which affects the health and well-being of an individual and their ability to maintain a healthy lifestyle. Results in the field of body image research and its relationship with sports participation have been mixed, meaning that the effect of athletic involvement on body image in unclear. This study uses a sample of 142 adult females to address the question of whether participation in sports, and aesthetic sports in particular, has an effect on body concern. The results of this study indicate no link between participation in sports and body concern in a sample of non-elite-level athletes from a wide spectrum of sports, including aesthetic sports. The results do indicate that a large proportion of the variance in body concern can be explained by psychological and sociocultural variables, age and Body Mass Index. The relationship between these variables and scores on the Body Shape Questionnaire (BSQ) are modelled using structural equation modelling.

1.1 Introduction

Body image is a multidimensional construct (Banfield & McCabe, 2002) which is defined as the internal representation of the external appearance (Hausenblas & Symons Downs, 2001). Body image includes behavioural aspects as well as attitudes, perception, fear of fatness and preference for thinness, among other dimensions. Body image has both positive and negative features, and is relatively stable over time, although it can be influenced by situational factors (Wood-Barcalow, Tylka & Augustus-Horvath, 2010). It is known that in extreme cases poor body image can lead to clinical eating disorders, such as anorexia nervosa and bulimia nervosa (McVey et al., 2010), but even minor body concerns can lead to exercise avoidance, eating pathology such as binge eating, restrictive dieting or self-induced vomiting, and other unhealthy behaviours, like the inability to stop smoking or the use of anabolic steroids (Grogan, 2010). Studies on body image and its relationship with clinical eating disorders have produced interesting results and furthered the field (Cash, 2004). However, eating disorders should not be the sole focus of research on body image and it is important to also focus on body image in the normal population, since the effects of body image upon human development and quality of life are far-reaching. In addition to potential deficits to mental health such as the development of clinical eating disorders, there are financial consequences, both at the level of the individual and society, such as money spent on diet products and surgery (Hausenblas & Symons Downs, 2001).

An individual's subjective view of their own body can be more salient than how they are viewed by others (Cash, 2004). Body image, especially body dissatisfaction, has been shown in the literature to have an effect on eating disorders and dieting (Ata, Ludden & Lally, 2007). Although everybody has a "body image", disturbances in body image do not affect all groups equally; they are more common in younger than older people, more affluent people, white people rather than ethnic minorities and people with higher Body Mass Index (BMI) (Hausenblas & Symons Downs, 2001). Although disturbances in body image and eating disorders in males are becoming increasingly common, and are increasingly recognised in the scientific literature and the media, it is still the case that body image disturbances more commonly affect women (Botta, 2003), and women are the focus of much of the literature on body image (Cohane & Pope, 2001) as well as the focus of the current study.

The literature on body image is broad and has input from many different fields of study (Cash, 2004). It is clear from the existing literature that body image is influenced by both psychological factors, such as personality and self-esteem, and by sociocultural factors like interactions with peers and family. Whilst there has been some attempt at integration of the broad literature in this area, it is clear that more work is needed to present a full picture of risk factors associated with poor body image and the relationship with sports participation,

where results have been mixed. The psychological and sociocultural factors influencing body image will be reviewed in more depth in the sections which follow.

The influence of psychological and sociocultural factors on body image has been shown consistently, however, findings with regards to participation in sports and type of sport have been less consistent. Frequently, studies have pointed to higher prevalence of eating disorders and body image dissatisfaction in athletes involved in aesthetic sports (Davis, Kennedy, Ravelski & Dionne, 1994), but findings have been inconsistent, with some researchers finding all sports equally likely to have a negative effect on body image, (e.g. Sundgot-Borgen, 1994), and others finding the reverse, that sports participation has a positive influence on body image, (e.g. Hausenblas & Symons Downs, 2001). The existing literature on the relationship between sports participation, sports type and body image will be reviewed in more detail in the section 1.4.

1.2 Psychological Factors Influencing Body Image

Psychological factors known to be involved in development of body image dissatisfaction, personality, self-esteem and locus of control, will now be discussed in detail.

1.2.1 Personality.

Brookings and Wilson (1994) state that factors involved in the development of eating disorders, which is related to body image, include exaggerated need for approval, becoming obsessed, instability of mood and low self-esteem. These are all broadly covered under the personality trait of neuroticism. A study by Miller, Schmidt, Vaillancourt, McDougall and Laliberte (2006) used a non-clinical undergraduate sample and found that neuroticism and extraversion were involved in body image. However, low extraversion was only involved in women who also score high on neuroticism. This study found a relationship between scores on the eating disorders inventories and high scores on neuroticism. A study by Swami, Hadji-Michael and Furnham (2008) found high extraversion and low neuroticism to be predictive of positive body image and so it can be assumed that the reverse pattern would be seen for negative body image, with high neuroticism and low extraversion being risk factors. Kvalem, von Soest, Roald and Skolleborg (2006) also found low levels of neuroticism and high levels of extraversion to be associated with positive body image.

Additionally, Ghaderi and Scott (2000) found differences in the levels of openness, agreeableness and conscientiousness in addition to the well-established findings relating to neuroticism and extraversion, when comparing adults with a lifetime history of eating disorders to a non-eating disordered group. This finding is not commonly replicated. These

authors also state that assessing personality helps a clinician to understand the cause and course of an eating disorder as well as the reason it is maintained.

Broadly speaking, extraversion seems to function as a protective factor, while neuroticism is a risk factor and the involvement of any other personality factors in body image has not been widely replicated.

1.2.2 Self-esteem.

Self-esteem is defined as the extent that an individual values, approves or likes themself (Blascovich & Tomaka, 1991). Ata, Ludden and Lally (2007) claim that self esteem has been found to be the number one predictor of poor body image and claim that higher self-esteem is likely to be protective against developing body image disturbances. The direction of the relationship between body image and self-esteem is not yet known, although researchers have suggested that body dissatisfaction predicts self-esteem rather than the reverse (Grogan, 2010). It is predicted that self-esteem will be strongly related to body image in the current study.

1.2.3 Locus of Control.

Locus of control refers to an individual's general expectation regarding where the control of their life resides (Scoffier, Paquet & d'Arripe-Longueville, 2010). Originally a unidimensional construct, the locus of control scale designed by Rotter (1966) measured only internal versus external locus of control. However, The most commonly used measure of locus of control is Levenson's (1972) model which measures three subscales of locus of control; internal, powerful others and chance. A study by Furnham & Greaves (1994) found that individuals with a locus of control which placed the control in the hands of powerful others or chance had higher levels of body image disturbance than those who have an internal locus of control, which meant that they feel as if they control their own lives. It is therefore expected that the current study will find that internal and chance locus of control are related to body concern, but that internal locus of control is not related.

1.3 Sociocultural Factors Influencing Body Image

A variety of sociocultural factors have been related to body image, including family and peer influences, appearance-related teasing and social comparisons. These will be reviewed in the sections which follow.

1.3.1 Family.

According to Parke and Buriel (2008) behaviors, values and attitudes are transmitted through the family. It is logical that this would include beliefs, behaviours and attitudes about the body and therefore the family is likely to have a strong influence on body image. Individuals raised in an appearance-focused environment are more concerned with their appearance (Helfert & Warschburger, 2011), it is therefore hypothesised that individuals who report that their family members have engaged in dieting or exercise behaviours or currently engage in these behaviours in order to lose or maintain their weight will report more body dissatisfaction. Family encouragement to diet or lose weight has been suggested as the strongest predictor of body dissatisfaction (Kluck, 2010). Both the mother and father have been found to have an effect on body image in adolescents (Helfert & Warschburger, 2011), in this study it is expected that the way in which they affect body image in the female population differs between male and female relatives. The role of individual family members will be examined in this study, including mother or other female caregiver (as it is increasingly common for children to be raised in households with step-parents etc), father or other male caregiver, and same-sex and opposite sex siblings using an adaptation of the Friends and Family Scale (Karazsia, 2007).

Some studies find that the influence of the mother on body image is especially strong, (e.g. Neumark-Sztainer, 2005; Hahn-Smith & Smith , 2001), and this is expected to be replicated here. Perhaps, the mother acts as a role model for healthful or positive behaviours and attitudes which are then likely to be copied. A similar pattern may be found for unhealthy and negative patterns of behaviour. The father, or male caregiver is not likely to act as role model as it does not seem likely that females would model their body image related thoughts, attitudes and behaviours on male members of the household but may be involved in teasing or appearance-related comments. A study by Keery, Boutelle, van der Berg and Thompson (2005) supports this theory as participants in their study reported teasing from fathers was more common than teasing from mothers. It was also reported that sibling teasing is more likely to occur where father teasing is present. In a study by Eisenberg, Berge, Fulkerson, and Neumark-Sztainer (2005) approximately 30% of females reported that they had experienced appearance-related teasing by their family during adolescence. Scoffier, Maiano and d'Arripe-Longueville (2010) found that positive relationships with parents lead to reduced disturbed eating attitudes in adolescent female athletes, who were engaged in aesthetic sports at an elite level, which demonstrates the importance of families in the development of positive body image in athletes.

1.3.2 Peers.

Peers create the appearance culture in which an individual lives, in schools, Universities and offices (Helfert & Warschburger, 2011) and so the influences of peers and friends are estimated to have a large effect on body image development and maintenance. There are several ways in which peers may affect body image; through teasing, through social comparisons which the individual makes with their peers as well as through the dieting and exercise behaviour they engage in and the extent to which they encourage an individual to engage in these behaviours.

Social comparisons have been shown to be a major factor in the development of body image disturbances (Stormer & Thompson, 1996). Both upward (negative) and downward (positive) comparisons can be made, and those who have a tendency to make more upward comparisons are known to be at higher risk of developing body image disturbance. There has been less work on downward social comparisons, but the studies which have been conducted found them to be related to higher levels of body satisfaction (Bailey & Ricciardelli, 2010). Bailey and Ricciardelli (2010) found that positive appearance-related comments were associated with more downward comparisons and negative comments were associated with more upwards comparisons and it appears negative comments on appearance are more salient than positive comments.Grogan (2010) suggests that social comparisons are related to the societal tendency to construct womens bodies as objects which are to be evaluated and which are viewed in a very different way to mens bodies. It is predicted that the tendency to make social comparisons is positively related to body dissatisfaction in this study.

Another salient factor is teasing by peers. In a study by Eisenberg et al. (2011), approximately 30% of females reported having been teased by peers in adolescence which is around the same as had reported being teased by family. This figure drops in young adulthood, however, the effects of peer teasing in childhood and adolescence is known to last into adulthood. Grilo, Wilfley, Brownell and Rodin (1994) showed that teasing about appearance and weight growing up was negatively related to evaluation of appearance and positively related to body dissatisfaction as an adult. Furthermore, Thompson, Fabian, Moulton, Dunn and Altabe (1991) report that women who are teased about their appearance as children are more likely to experience body dissatisfaction as adults. In a study by Ata, Ludden and Lally (2007) a group at high risk with regards to negative eating attitudes and behaviours reported more peer teasing than low-risk group. Annis, Cash and Hrabosky (2004) report that poorer body image and psychosocial functioning is associated with more frequent “stigmatizing experiences”, not only during childhood but also during adolescence and adulthood, while a longitudinal study by Haines, Neumark-Sztainer, Eisenberg, and Hannan, (2006) found that girls who were teased about their weight as children were more likely to

become chronic dieters. A study by Scoffier, Maiano and d'Arripe-Longueville (2010) showed that disturbed eating attitudes were lower in a sample of adolescent elite aesthetic athletes when they felt accepted by their peers and show peer influence is also related to sports participation. It is predicted that individuals who report higher levels of appearance-related teasing as children will report higher body dissatisfaction as adults.

1.4 Participation in Sports, Type of Sport and the Relationship with Body Image

Female athletes have long been considered an at-risk group for the development of poor body image and eating disorders (Petrie, Greenleaf, Reel & Carter, 2009). For example, the "female athlete triad" is a term coined for a series of symptoms including disordered eating, amenorrhoea and osteoporosis which appear together in female athletes, although there is debate about whether athletes are at increased risk of this pathology (DiPietro & Stachenfeld, 2006). Similarly, "Anorexia athletica" describes an eating disorder subtype unique to athletes, whereby the goal is to reduce weight to improve performance, rather than because of concern about appearance (Sudi, Öttl, Payerl, Baumgartl, Tauschmann & Müller, 2004). Females participating in aesthetic sports, such as dance, cheerleading, gymnastics and figure skating have been named as being at increased risk, above the general perceived risk of participating in any sport. However, results have been mixed and some studies show higher prevalence of eating disorders and body dissatisfaction in non-athletes and so perhaps, in the absence of the psychological and sociocultural risk factors discussed earlier, participation in sports has a positive effect on body image.

There are several proposed reasons why athletes may be more at risk of body image disturbances than non-athletes. Athletes may have a tendency towards perfectionism, may feel pressured by performing in public and wishing to please coaches or others with good performance. There may also be a belief that athletic performance could be improved through weight loss or muscle gain, (Harris, 2000) or there may be weight classes within the sport (Hausenblas & Symons Downs, 2001). Athletes may also experience pressure from coaches and judges or teasing, pressure or unfavourable comparisons with teammates. Body image in female athletes may be complex as they face a paradox, whereby they require muscle to perform well in their sport but must also conform to a societal ideal which praises slim bodies (Steinfeldt, Carter, Benton & Steinfeldt, 2011). Another theory is that uniforms worn in sports, especially when they are tight-fitting or revealing, may place extra pressure on the athlete and therefore worsen body image disturbance (Greenleaf, 2004). Although a study by Krane, Stiles-Shipley, Waldron and Michalenok (2001) found no difference in level of body dissatisfaction in females involved in sports with differing types of uniform, this anxiety has been reported by several other researchers. For example, a study by Reel and Gill (1996) over

50% over college-aged cheerleaders and over 60% of high school-aged cheerleaders reported that the revealing uniforms added to the pressure in cheerleading related to body weight. Thomsen, Bower and Barnes (2004) reported similar anxieties in high school volleyball players and so it seems it is not an issue limited to aesthetic sports. Price and Pettijohn (2006) reported greater body dissatisfaction in dancers when they were asked to practice in form-fitting leotards and tights when compared to their scores performing the same routine in their own loose-fitting clothes, which clearly indicated a direct effect of attire on body concern.

While some studies have reported that body concern and eating disorders are more common among athletes, others have found that athletes actually experience more positive body image than non-athletes. For example, Martinsen, Bratland-Sanda, Eriksson and Sundgot-Borgen (2010) found that dieting and eating disorders were more common among non-athletes than athletes in a sample of Norwegian school children. The study found no difference between athletes participating in leanness or non-leanness sports. Hausenblas and McNally (2004) also found higher levels of body dissatisfaction in non-athletes, compared to athletes. Additionally, Vicario and Chambliss (2001) reported the positive side of dance education and found that almost none of their participants reported that dance made them dislike their bodies. Reinking and Alexander (2005) found that, while the athletes in their sample had overall lower body dissatisfaction, those involved in lean sports had higher body dissatisfaction and lower actual and desired body weights than non-lean sports. Some studies report that sports participation can lead to increased body satisfaction, fewer eating problems and higher self esteem (de Bruin, Woertman, Bakker & Oudejans, 2009). Hausenblas and Symons Downs (2001) conducted a meta-analysis and found more positive body image in athletes, regardless of sport type, when compared to non-athletes. Additionally, Richman and Shaffer (2000) found that in college-aged women, participation in sport improved body image. The direction of cause and effect is unclear, for example Wood-Barcalow, Tylka and Augustus-Horvath (2010) state that women with positive body image enjoy physical activity and so it is unclear whether participating in sports improves body image, or whether those with more positive body image are more likely to participate in sports. A study by Lowery, Kurpius, Befort, Blanks, Sollenberger, Nicpon and Huser (2005) showed that health-related behaviours, including exercise, were negatively related to body shame and body dissatisfaction. This could lead us to believe that regularly participating in sports could improve body image. A study by Russell (2004) finds that the body satisfaction women feel whilst playing sport may not extend to social situations. Furthermore, studies have found far-reaching effects of sports participation in adolescent girls, include higher self-esteem, improved academic performance and safer attitudes towards sexual health (Crissey & Crissey Honea, 2006).

Some studies find differences in body image disturbances between athletes involved in different types of sports, and many report higher levels of these problems in females involved in aesthetic sports. Aesthetic sports are judged rather than refereed and tend to place a strong emphasis on leanness (Klinkowski, Korte, Pfeiffer, Lehmkuhl, & Salbach-Andrae 2008). For example, Langdon and Petracca (2010) stated "dance has been found to both enhance and undermine body image" (p.360). Davison, Earnest and Birch (2002) reported higher weight concern amongst 5 and 7 year old girls involved in aesthetic sports when compared to age-matched controls engaged in non aesthetic sport or no sport. Also, Davis and Cowles (1989) found higher levels of diet and weight concerns in athletes in a sport where a thin build is an advantage. Sundgot-Borgen (1994) also found higher prevalence of eating disorders in sports which emphasise leanness or being a specific weight. Therefore, in aesthetic sports, the desire to be leaner comes from a belief that it will improve performance which is maintained through the sporting environment (Krentz & Warschburger, 2011). Abbott and Barber (2011) reported differences in body image in girls participating in sports of different types; that is, between girls involved in aesthetics sports and those who are either involved in non-aesthetic sports, both aesthetic and non-aesthetic sports, or those who reported no participation in sports.

Level of sport may be a salient factor in whether an athlete develops positive or negative body image, with disordered eating more likely in competitive or elite-level athletes (Bissell & Birchall, 2008). For example, de Bruin, Oudejans and Bakker (2007) report differences in dieting and body dissatisfaction in elite gymnasts, non-elite gymnasts and controls who were not engaged in aesthetic sports. Pricard (1999) also reported higher levels of pathological eating and higher risk of developing eating disorders in athletes involved in sports at higher levels. The length of time that an individual has been involved with a sport may be another salient factor. For example, there may be differences between sports which were begun during childhood and those which started in adulthood only.

1.5 Current Study

The aim of the current study is to examine the relationship between sports participation, type of sport and sociocultural and psychological variables and body concern measured using the Body Shape Questionnaire (BSQ), in a population of adult females. The main research questions for this study are: Are differences in body image explained fully by sociocultural and psychological factors? And what is the influence of sports participation and sports type? The main hypotheses of the study are that sports participation will have a positive effect on body image, that is, those involved in sport will have a lower BSQ score. It is predicted that the type of sport an individual is involved in will not affect BSQ score and that

athletes involved in sport at higher levels (ie competitive or elite rather than recreational) will have higher BSQ scores. It is predicted that athletes who began sports at a younger age and have continued into adulthood will have higher BSQ scores than those who began sports as adults. It is also predicted that neuroticism will be positively- and extraversion negatively-related to BSQ score, and that self-esteem will be related to BSQ score as well as to BMI. It is predicted that individuals with external/powerful others or chance locus of control will score higher on the BSQ. We also expect that individuals who report more childhood appearance-related teasing and making more social comparisons will score higher on the BSQ, and that individuals who report close friends who diet or exercise to lose weight and encourage them to do so will score higher on the BSQ. It is also expected that individuals who report family members who diet or exercise to lose weight and encourage them to do so will score higher on the BSQ.

2. Method

2.1 Participants

Participants were 142 females, from 17 to 57, (M = 25.07, SD = 8.12). Participants were recruited opportunistically by the researcher, using social networking sites, University mailing lists and contacting sports clubs and University Societies using email.

2.2 Measures

Body Mass Index.

A BMI calculator was provided to ensure accuracy, where participants were able to enter their weight and height, in either imperial or metric units, on a sliding scale.

Body concern.

The short form of the Body Shape Questionnaire (BSQ), from Dowson and Henderson (2001) has 14 items and, like the full BSQ, is designed to measure concern over body image. Responses were made on a six-point scale, (1 = *Never*, 6 = *Always*), with a higher score representing more concern about the body. The alpha coefficient for this scale (α = .97) shows good internal reliability. The mean and standard deviation are shown in Appendix A.

Personality.

Personality was measured using a 100-item scale taken from the International Personality Item Pool (IPIP) (Goldberg, Johnson, Eber, Hogan, Ashton, Cloninger & Gough, 2006),

which is an open-source and copyright-free pool of personality items. Responses were made on a five-point scale, (1 = *Very inaccurate*, 5 = *Very accurate*). Alpha coefficients for each personality dimension were as follows: neuroticism (20 items: α = .93), extraversion (20 items: α = .94), openness (20 items: α = .88), agreeableness (20 items: α = .87) and conscientiousness (20 items: α = .92). Means and standard deviations are shown in Appendix A.

Locus of Control.

Locus of control was measured using the classic IPC scale (Levenson, 1972), a well-established measure of locus of control containing 24 questions, on three subscales, internal, powerful others and chance. Responses were made on five-point scale, (1 = *Strongly disagree*, 5 = *Strongly agree*). Alpha coefficients were as follows: internal (8 items: α = .59), powerful others (8 items: α = .76) and chance (8 items: α = .73). Means and standard deviations are shown in Appendix A.

Self-esteem.

The measure of self-esteem used in this study was the Rosenberg Self-Esteem Scale (Rosenberg, 1965). This scale contains 10 items and responses are made on a four-point scale, (1 = *Strongly disagree*, 4 = *Strongly agree*), with a higher score representing higher self-esteem. The alpha coefficient for this scale in this sample was (α = .881), and the mean and standard deviation are shown in Appendix A.

Peer influences.

This study looks at two distinct peer influences on body image concern: teasing based on physical appearance and social comparisons made by the individual. Appearance related teasing by peers during childhood was measured using the Physical Appearance Related Teasing Scale, (PARTS; Thompson, Fabian, Moulton, Dunn & Altabe, 1991). This 18-item scale is scored on a five-point scale, (1 = *Never*, 5 = *Frequently*), with higher scores representing more appearance-related teasing during childhood. The alpha coefficient for this scale (α = .92) was high, indicating good internal reliability. The mean and standard deviation is shown in Appendix A.

Social comparisons are measured as in Schutz, Paxton and Wertheim (2002). Participants were asked three questions relating to their tendencies to make social comparisons, if she would describe herself as someone who compared her body with those of others; if comparing her body with others had ever made her feel as if maybe she ought to diet; and if comparing her body with others had ever led her to actually begin dieting. These

were rated on a five-point scale, (1 = *Never*, 5 = *Always*), with a higher score indicating a higher tendency to make social comparisons.

The friends part of Family and Friends Scale (FFS; adapted from Karazsia, 2007) was also used to measure the influence of peers diet and exercise behaviour and encouragement of the individual to also engage in such behaviours. This was measured using *true* or *false*. The alpha coefficient for this sub-scale (6 items: α = .75) was above the acceptable level for reliability. The mean and standard deviation are shown in Appendix A.

Family influences.

The Family and Friends Scale (FFS; adapted from Karazsia, 2007) was used to measure other family members participation in diet and exercise and their encouragement of the individual to engage in these behaviours. This scale was slightly modified from the original. Firstly, it was felt that "mother" or "father" are not always relevant in a time when families are becoming more complex and more people are raised in a household with other adult members, such as step-parents and therefore, this was changed to mother/main female caregiver and participants were given the option to leave the answer blank if they had not lived with a family member. The scale was also altered so that same-sex and opposite-sex siblings were measured separately, as there is reason to believe that the relationships would be different. The design of the scale is such that answers were given using *true* or *false* and the answers can then be summed in different ways to produce measurements of different family members' influence. The alpha coefficients for these subscales, with behaviour and encouragement summed, were as follows: mother (6 items: α = .72), father (6 items: α = .80), same-sex sibling(s) (6 items: α = .97), opposite-sex sibling(s) (6 items: α = .96), parents (12 items: α = ..80) and siblings (12 items: α = .78).

Sports Participation.

Participants were given a list of sports, which is reproduced in Appendix B along with the type of sport (i.e. aesthetic or non-aesthetic) and the number of participants who reported regularly participating in that sport. Participants were asked to tick any which they regularly participated in. For the purposes of analysis, participants were divided into those who did not participate in sports, those who participated in aesthetic sports, those who participated in non-aesthetic sports and those who participated in both aesthetic and non-aesthetic sports. There was also an opportunity to add in any sports which did not appear in the list and to add other exercise which does not count as sport, which are listed in Appendix C. Participants were also asked to indicate what age they had started their main sport at and what level they were playing at (purely recreational, competitive, professional etc). Participants were given the

same list of sports and asked to indicate which, if any, they had participated in as a child and to what level.

2.3 Procedure

Participants completed a series of measures, online via Lime Survey, after being presented with information on informed consent, ethics and right to withdraw. The full questionnaire is available in Appendix D. On completion of the study participants were given an opportunity to be entered into a prize draw to win £50 in gift vouchers.

2.4 Analyses

Following data preparation and checking, bivariate correlations were used to examine relationships between variables, after which regression analyses were used to test individual hypotheses regarding the relationship between the predictor variables and the outcome measure, BSQ score. This was carried out using PASW 17.0. Predictors which were identified as having a significant relationship with BSQ score were then entered into a structural equation model which was then used to demonstrate the relationship between BSQ score and predictor variables, this was using Amos 17.0.

3. Results

3.1 Descriptive statistics

A table showing means and standard deviations is given in Appendix A. A full list of sports in which individuals participated is available in Appendix B, but the type of sport is shown in Table 1.

Table 1
Number of participants involved in each type of sport

Sports type	No. of participants	%
No sports	31	21.8
Non-aesthetic sports only	37	26.1
Both aesthetic and non-aesthetic sports	27	19
Aesthetic sports only	47	33.1

The level of sports of the participants is shown in Table 2. More than half of this sample, 58.5%, reported being involved in sports only at recreational level and only 9.4% were involved in sports at an elite level. This is where this study differs from previous studies on the influence of type of sport and body dissatisfaction, as those studies have mainly focused on elite athletes.

Table 2
Number of participants involved in sports at each level

Level of Sport	No. of participants	%
Recreational only	83	58.5
Competition at local or regional level	21	14.8
Competition at national level	25	17.6
Competition at international level	11	7.7
Professional	2	1.4

3.2 Analysis

Tables showing bivariate correlations are available in Appendix E for psychological variables, Appendix F for sociocultural variables and Appendix G for sports-related variables. The average Body Mass Index (BMI) score of the participants was 22.32 (*SD* = 3.45), which is within the normal range according to World Health Organization guidelines (WHO, 2011). BMI is positively correlated with BSQ score, as predicted, (β=2.94, R^2 = .063, $F(1,140) = 9.4$, p<.05). Age has a negative correlation with BSQ score with older individuals scoring lower on the BSQ and a significant proportion of the variance in BSQ score was explained by age, (β= -.437, R^2 = .036, $F(1, 140) = 5.236$, p< .05).

With regards to the relationship between BSQ and personality, the only significant finding was with neuroticism. That is, individuals scoring higher on neuroticism also scored higher on this measure of body dissatisfaction, (β = .516, R^2 = .179, $F(1,140) = 30.441$, p<.001). No other personality variables were significant: extraversion, (β = -.027, t = -.243, p > .05), agreeableness, (β = -.165, t = -1.07, p > .05), conscientiousness, (β = -.045, t = -.339, p > .05) and openness, (β = .007, t = .047, p > .05), (R^2 = .013, $F(4, 137) = .456$, p>.05). The finding with neuroticism is in line with predictions, although extraversion was also predicted to have an involvement in body image and this has not been replicated in the current study.

Self-esteem has a strong relationship with BMI, (β = .134, R^2 = .057, $F(1,140)$ = 8.524, p<.05) and is also strongly negatively related to BSQ score with individuals with higher self-esteem scoring lower on the BSQ, (r = -.482, p<.001), although the direction of this relationship has yet to be determined, (Grogan, 2010). This is in line with predictions. Self-esteem is also negatively related to childhood teasing, (β = -.418, R^2 = .030, $F(1,139)$ = 4.27, p<.05), and strongly negatively related to the tendency to make social comparisons, (β = -.279, R^2 = .181, $F(1,139) = 30.816$, p<.001).

Internal locus of control is not related to BSQ, (β = .384, R^2 = .014, $F(1,140) = 2.056$, p>.05), however, chance (β = .262, t = 1.119, p = .265) and powerful others (β = .488, t = 2.094, p < .05) locus of control are related to BSQ, R^2 = .068, $F(2, 139) = 5.047$, p<.05), this is in line with predictions. Because there is multicollinearity between these two variables, powerful others locus of control will be used in future analyses as this is the stronger predictor of BSQ.

The influence of the family was perhaps less strong than had been predicted. Only parental behaviour and encouragement to diet or exercise to lose or control weight were significantly related to BSQ score. Mother's behaviour (β = .759, t = .549, p = .584) and encouragement (β = 3.113, t = 2.381, p = .019), (R^2 = .075, $F(2,139) = 5.604$, p<.05), and father's behaviour, (β = 1.64, t = 1.413, p = .16) and encouragement, (β = 2.47, t = 1.852, p = .066), (R^2 = 5.413, $F(2,139)$ = , p<.05), as well as a combined score from both parents for diet

and exercise behaviour, (β = .746, t = .959, p = .339), and encouragement, (β = 1.938, t = 2.388, p = .018), (R^2 = .097, F(2, 139) = 7.473, p<.001), were significant, as well as a combined parental score for both parents and behaviour and exercise, (β = .623, R^2 = .062, F(1, 140) = 9.203, p = .003). For simplicity and to avoid the problem of multicollinearity, the combined parental score will be used in future analyses. However, sibling behaviour, (β = .184, t = .149, p = .881) and encouragement, (β = .251, t = .540, p = .590) did not show any significant relationship with BSQ score, (R^2 = .014, F(2, 139) = .960, p>.05), even when only female sibling's behaviour, (β = -.228, t = -.148, p = .882) and encouragement (β = .251, t = .130, .897), predicted to have the stronger influence, were considered, (R^2 = .00, F(2, 139) = .011, p>.05).

There were four measurements in this study examining the way in which peers could influence body image: appearance related teasing in childhood, social comparisons the individuals make with peers, the diet and exercise behaviour of peers and their encouragement for the individual to engage in these behaviours. Childhood teasing is strongly related to BSQ score, with individuals reporting higher levels of teasing also reporting more body dissatisfaction, (β = .584, R^2 = .152, F(1,140) = 25.046, p<.001). Level of childhood teasing is also related to BMI, (β = .923, R^2 = .045, F(1,139) = 6.625, p<.05), and negatively related to self-esteem, (β = -.418, R^2 = .030, F(1,139) = 4.27, p<.05). The tendency to make social comparisons was also strongly related to BSQ score, explaining 68.3% of the variance, (β = 4.586, R^2 = .683, F(1,140) = 301.386, p<.001). The tendency to make social comparisons is also related to childhood teasing, (β = .080, t = 3.904, p = 000), powerful others locus of control, (β = .016, t = .415, p = .679), neuroticism (β = .021, t = .924, p = .357), and self-esteem, (β = -.20, t = -2.864, p =.005), which explain 27.6% of the variance in tendency to make social comparisons, (R^2 = .276, F(4,131) = 12.484, p<.001). It is not significantly related to BMI, (β = .091, R^2 = .006, F(1,139) = .848, p>.05). Close friends diet and exercise behaviour, (β = -.058, t = -.051, p = .960), and encouragement for the individual to engage in these behaviours, (β = 2.648, t = 1.549, p = .124), had no influence on BSQ score, (R^2 = .024, F(2,139) = 1.693, p>.05), which is contrary to the predictions of the study.

The main hypothesis of the study, that participation in sport would have a positive effect on body image and reduce body dissatisfaction level was not confirmed, as there was no significant difference in BSQ score between those who participated in sport and those who did not, (F(1, 140) = 0.31, p>.05). However, another hypothesis, that type of sport would not have an influence on body dissatisfaction, was confirmed as there were no significant differences in BSQ score in the four different sports groups, (R^2 = .012, F(1, 140) = 1.664, p>.05). Level of sport was also unrelated to body dissatisfaction, (R^2 = .016, F(1, 140) = 2.312, p>.05), as was the length of time participants had been involved in a sport, (R^2 = .018,

$F(1, 140) = 2.637$, p>.05), and the age they were when they started participating in the sport, ($R^2 = .001$, $F(1, 140) = .081$, p>.05), contrary to the predictions of this study.

Given the findings of previous regression analyses, the most successful predictors were added to a further regression model and it was found that this model, containing neuroticism ($\beta = .062$, t = .840, p = .403), self-esteem ($\beta = -.452$, t = -1.920, p = .058), social comparisons ($\beta = 4.276$, t = 14.162, p = .000), childhood teasing ($\beta = .104$, t = 1.438, p = .154), BMI ($\beta = 1.181$, t = 3.872, p = .000), age ($\beta = .054$, t = .415, p = .679), powerful others locus of control ($\beta = .112$, t = .917, p = .362) and combined parental diet and exercise behaviour and encouragement score ($\beta = .157$, t = 1.154, p = .252) was able to explain 83.6% of the variance in BSQ score, ($R^2 = .836$, $F(8,86) = 54.824$, p< .001).

These predictor variables were then entered into a structural equation, the best-fitting model is shown in Figure 1, which explains 94.8% of the variance in BSQ score, with a χ^2 (21, N = 142) = 38.54, p < .05, RMSEA = .077, AIC = 104.54, CFI = .957, TLI = 909.

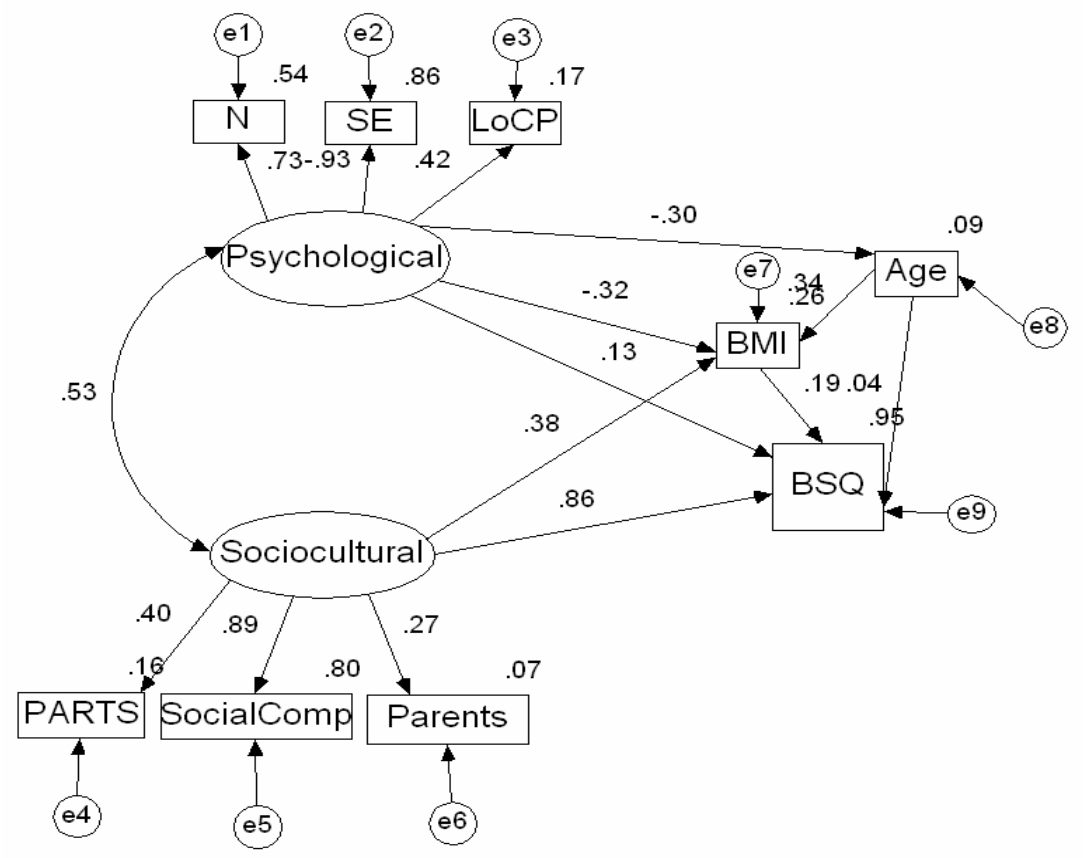

Figure 1. Structural equation model showing the relationship between BSQ and psychological and sociocultural predictor variables.

4. Discussion

4.1 General Discussion

In this adult female population, psychological and sociocultural variables were able to account for 94.8% of the variance in body dissatisfaction, with no significant influence of sports participation, type of sport, level of sport or age of starting sport. We hypothesised that participation in any type of sport would have a positive effect on body image, but this was not supported by the data as there was no difference in BSQ score between individuals who reported regular participation in sport and those who did not. The Root Mean Square Error of Approximation (RMSEA) for the model did not reach the .05 level usually required to pronounce a model as a good fit of the data. However, there is some dispute about the use of RMSEA as an absolute index of fit, since it is influenced by factors such as factor correlations and number of indicators, (Savalei, 2010) and other measures of model fit were at appropriate levels for an acceptable model, including chi square, Comparative Fit Index (CFI), Akaike Information Criteria (AIC) and the Tucker-Lewis Index (TLI). However, it should be noted that chi square can be influenced by sample size and other factors like number of variables, (Kline, 2011) and so it would be wise to repeat this model in a larger sample size.

The results of this study supported the hypothesis that the type of sport an individual was involved in would not affect their BSQ score as there was no difference between BSQ between sports types. Where previous studies had found higher levels of body concern in females involved in aesthetic sports, this did not replicate in the present study. This may be due to sports level effect as the studies which had found these differences typically focused on elite athletes, while in the present study, more than half of participants, 58.5%, were involved in sport only at recreational level and only 11 individuals in the study reported being involved in sport at international level and only 2 reported being involved in sport professionally, meaning that only 9.1% of the sample were elite athletes. There may also be an effect of age as this study used only adults, but previous studies had used children, adolescents or University students. Although this study did not find a significant effect of either length of time an individual had been involved in sport or of the age they were when they started.

The current study found no difference in BSQ score between athletes involved in sports at different levels, although the majority of the sample was not involved in sports at an elite level and so future studies could include more elite athletes in the sample to further test this. The results of this study are interesting as it shows the effects of sports on a mainly non-competitive sample, more reflective of the normal population. This perhaps means that

aesthetic sports have been given an unfair reputation in the scientific literature, with many studies claiming that they are responsible for eating disorders and poor body image, where in reality it may not be the sport that is causing this, but the added pressure of performing at the elite level or underlying psychological and sociocultural risk factors. Whilst it is important to address these problems, the results of the current study show that there is likely no greater risk of poor body image associated with participating in aesthetic sports at the recreational or locally competitive level in adult women.

One strength of this study lies in its relatively novel use of structural equation modelling to examine the relationship between psychological and sociocultural variables and body concern. Modelling approaches are not commonly used in the broad field of body image and eating disorder research. Understanding the interactions between predictor variables as well as their relationship with the outcome variable is essential to fully understand body image, its underlying predictors and therefore create effective intervention programmes, (Wood-Barcalow, Tylka & Augustus-Horvath, 2010). To create interventions which can successfully improve body image must be the end goal of research in this field. The current study also aimed to include both psychological and sociocultural variables to present a broader view of the predictors of body concern, which is an improvement on studies which include few predictors, however it is not possible to include all possible predictors. For example, Competitiveness and perfectionism are two predictors which have been shown to relate to body image in athletes, but these were not included in the current study due to constraints on space. These may relate more to elite-level athletes which was not the focus of the current study.

Another strength is the use of an adult population, who are mainly involved in sport at a non-elite level. Studies examining the relationship between sports participation and body image concerns have traditionally focused on adolescent populations, often in elite-level competitors. While the results of such studies do have implications for coaching and monitoring such “at-risk” adolescents, the conclusions they draw regarding the effect of aesthetic sports and increased body concern are not generalizable to individuals who participate in sports recreationally. Yet this distinction is rarely made and the message that aesthetic sports are linked to body dissatisfaction and eating disorders prevails. The results of the current study demonstrate that in an adult population, individuals participating in aesthetic sports at a non-elite level are not at increased risk of developing body dissatisfaction.

Previous studies looking at body image had found that low extraversion and high neuroticism were risk factors for poor body image. The current study found a strong relationship between body concern and neuroticism but did not find a significant influence of extraversion. This may have been because the BSQ measures only body concern and measures used in the studies which found a relationship with extraversion measure more than

one facet of body image and so future studies would benefit from using a broader measure of body image. Self-esteem was shown to have a strong relationship with BSQ score, in line with predictions. The direction of this relationship is not known but, as it has such a strong relationship, it has been suggested that it could be a powerful target in designing intervention programmes to improve body image (Grogan, 2010), which is surely the ultimate goal of research in this area. As predicted, powerful others and chance locus of control were positively related with BSQ score and so individuals who do not view control of their lives as within their own control score higher on body concern.

It was predicted that individuals who report more appearance-related teasing during childhood and making more social comparisons with peers would score higher on body concern and this was supported by the results of the current study. Both of these sociocultural factors are related to self-esteem. It was hypothesised that individuals who report that their close friends were engaging in diet and exercise behaviour and were encouraging them to also engage in these behaviours would report more body concern but the results do not support this. Previous studies have found strong influence of peer behaviour and encouragement on body concern, but it may be that in an adult sample this influence is not felt as strongly.

There were mixed results in this study regarding the influence of the family. Whilst parental diet and exercise behaviour and encouragement were found to have a significant influence on BSQ score, no significant relationship was found with peers, even when same-sex and opposite-sex sibling were examined separately. This may be because an adult sample is more likely to live away from their siblings and also because the competitive sibling environment does not survive into adulthood.

Body image is now conceptualised as a multidimensional construct, incorporating thought, feelings and behaviours. The BSQ only measures one aspect of body image, the preoccupation with the body. It is unfortunate that there is no one standard measure of body image and researchers have suggested that this is the reason for the mixed results when examining the relationship between body image and sports participation. If this could be addressed, findings would surely benefit (Hausenblas & Symons Downs, 2001).

It is important to consider sample size when using multivariate statistical techniques such as structural equation modelling. Researchers are in agreement that a large sample size is best for SEM, though no consensus has been reached on the exact number of participants required for reliable results. Some researchers state that 100 participants is adequate, while others state that ten participants per variable measured should be reached and others call for a sample of over 200 (Gallagher, Ting & Palmer, 2008). The current study had a sample of 142, which is adequate following most of these guidelines but as measurements of model fit such as chi square are influenced by sample size, it would be wise to re-run the model with a larger sample size.

Another concern is the length of the questionnaire as long questionnaires can lead to increased drop-out. Whilst every effort was made to keep the questionnaire as short as possible, for example through the use of short-scale measures, it was long due to the number of predictor variables measured. Manfreda and Vehovar (2003) reported that length of questionnaire was the biggest factor of drop-out in online surveys such as the one used in the current study. In the present study, a prize incentive was offered to those who successfully completed the questionnaire, although the participant's ethical right to leave any questions blank was maintained. Some studies have suggested that this is an effective way to reduce drop-out rates and even to encourage more people to participate initially (Frick, Bächtiger & Reips, 2001).

The current study considers influences from family members and peers but does not consider influences from other sources such as teachers or coaches, which are of particular interest when examining athletes. Scoffier, Maiano and d'Arripe-Longueville (2009) examines coaches and teammates and their influence on body image in sports. This study also did not examine romantic relationships (Sheets and Ajmere, 2005).

It is interesting to consider that the gap between women's aesthetic and non-aesthetic sports may be narrowing. It has been suggested that women's sports must have sex-appeal to gain coverage and sponsorship. Kian and Clavio (2011) report than often, female athletes are given less coverage than male athletes in the same sport. The coverage they are given often serves to reduce them to sex objects, comment on their appearance/attire, speculate on their personal lives or compare them disfavourably to their male counterparts. Thomsen, Bower and Barnes (2004) state that female athletes are portrayed by the media in a way which emphasises their beauty and sex-appeal and not their athletic ability. In this way, the distinction between those sports which are defined as aesthetic and those which are non-aesthetic is blurred. When female tennis players receive more attention for their attire and looks than their athletic ability and are treated differently by the press than male athletes, there may be an aesthetic component to all female sports.

4.2 Future Research

This study uses an entirely female adult population. Future studies could look at development of body issues and could also include males. Cohane and Pope (2001) have noted that male body image disturbance has been neglected in both the scientific and mainstream literature. Societal body ideals differ between men and women and so the nature of body dissatisfaction between genders also differs (Helfert & Warschburger, 2011). Male body image is likely complicated by the fact that some males wish to be thinner, while some wish to be larger and more muscular (Hildebrant, Alfano & Langenbucher, 2010). Females usually desire to be

thinner, research on males needs to therefore consider weight and muscle concerns, body issues in males are not unidimensional (Helfert & Warschburger, 2011; Ata, Ludden & Lally, 2007). This means that instruments and study findings based on research with females is likely not transferable to males (Helfert & Warschburger, 2011).

The current study examined the relationship between sports participation and body image in females. The literature in this area is vast and spans several decades, but the literature with regards to male body image and sports participation is more sparse. Similar to females, "at risk" males likely belong to aesthetic sports like gymnastics or running where low body weight is an advantage, and also to weight class sports like horse racing and boxing and sports where muscular build is required like wrestling, (Baum, 2006). Also, Galli and Reel (2009) state that Mens' body image is likely to also differ across different sports, in a similar fashion to findings in the literature on females. Filaire, Rouveix, Panafieux and Ferrand (2007) studied males participating in sports where a low weight is valued, namely judo and cycling, and found that these groups were more likely to engage in dieting behaviour than non-athletic controls. Whilst there has been some work in this area the psychological and sociocultural influences on body image in males and their relationship to sports participation and sports type are much less studied than the same phenomena in females.

The relationship between media consumption and body image has been studied (e.g. Ferguson, Winegard & Winegard, 2011), but less research has focused on specific sports media, such as sports and health and fitness magazines. Interestingly, a study by Ginsberg and Gray (2006) demonstrated that cover models on magazines of judged (i.e. aesthetic) sports were thinner than those on the cover of non-judged sports, displaying the thin ideal which is present in these types of sports. Thomsen, Bower and Barnes (2004) conducted a study using adolescent volleyball players and found that they suffered more feelings of negative body image when viewing this type of media, especially as the female athletes were portrayed in a way which emphasised their beauty rather than their athleticism. It does not seem that anyone has studied whether more consumption of these types of media generally lead to higher body dissatisfaction.

Although the current study did include a measure of how long the participants had been involved in a particular sport and what level, but did not ask how many hours a week they were involved in the sport or how intense the training is, it may be interesting to examine the effects of hours spent training and training intensity and this could be considered in future research.

References

Abbott, B.D. and Barber, B.L. (2011) Differences in functional and aesthetic body image between sedentary girls and girls involved in sports and physical activity: Does sport type make a difference? *Psychology of Sport and Exercise*, **12**, 3, 333-342

Annis, N.M., Cash, T.F. and Hrabosky, J.I. (2004) Body image and psychosocial differences among stable average weight, currently overweight, and formerly overweight women: the role of stigmatizing experiences. *Body Image*, **1**, 2, 155-167

Ata, R.N., Ludden, A.B. and Lally, M.M. (2007) The effects of gender and family, friend, and media influences on eating behaviors and body image during adolescence. *Journal of Youth and Adolescence*, **36**, 1024-1037

Bailey, S.D. and Ricciardelli, L.A. (2010) Social comparisons, appearance related comments, contingent self-esteem and their relationships with body dissatisfaction and eating disturbance among women. *Eating Behaviors*, **11**, 2, 107-112

Banfield, S.S. and McCabe, M.P. (2002) An Evaluation of the construct of body image. *Adolescence*, **37**, 146, 373-393

Baum, A. (2006) Eating disorders in the male athlete. *Sports Medicine*, **36**, 1, 1-6

Bissell, K. and Birchall, K. (2008) Through the hoop how sports participation displaces media use and is related to body self-esteem in competitive female athletes. *Journal of Sports Media*, **3**, 2, 25-59

Blascovich, J. and Tomaka, J. (1991) Measures of self esteem. In J.P. Robinson, P.R. Shaver and L.S. Wrightsman (Eds) Measures of Personality and Social Psychological Attitudes, pp115-116. San Diego, Califiornia: Elsevier.

Botta, R.A. (2003) For your health? The relationship between magazine reading and adolescents' body image and eating disturbances. *Sex Roles*, **48**, 389-399

Brookings, J.B. and Wilson, J.F. (1994) Personality and family environment predictors of self-reported eating attitudes and behaviours. *Journal of Personality Assessment*, **63**, 2, 313-326

Byrne, S. and McLean, N. (2001) Eating disorders in athletes: A review of the literature. *Journal of Science and Medicine in Sport*, **4**, 2, 145-159

Cash, T.F. (2004) Body image: past, present, and future. *Body Image*, **1**, 1-5

Cohane, G.H. and Pope, H.G., Jr. (2001) Body image in boys: A review of the literature. *International Journal of Eating Disorders*, **29**, 4, 373-379

Crissey, S.R. and Crissey Honea, J.(2006) The relationship between athletic participation and perceptions of body size and weight control in adolescent girls: The role of sport type. *Sociology of Sport Journal*, **23**, 248-272

Davis, C. and Cowles, M. (1989) A comparison of weight and diet concerns and personality factors among female athletes and non-athletes. *Journal of Psychosomatic Research*, **33**, 5, 527-536

Davis, C., Kennedy, S.H., Ravelski, E. and Dionne, M. (1994) The role of physical activity in the development and maintenance of eating disorders. *Psychological Medicine*, **24**, 4, 957-967

Davison, K.K., Earnest M.B. and Birch, L.L. (2002) Participation in aesthetic sports and girls' weight concerns at ages 5 and 7 years. *International Journal of Eating Disorders*, **31**, 3, 312-317

de Bruin, A.P.K., Oudejans, R.R.D. and Bakker, F.C. (2007) Dieting and body image in aesthetic sports: A comparison of Dutch female gymnasts and non-aesthetic sport participants. *Psychology of Sport and Exercise*, **8**, 507–520

de Bruin, A.P., Woertman, L., Bakker, F.C. and Oudejans, R.D. (2009) Weight-related sport motives and girls' body image, weight control behaviors, and self-esteem. *Sex Roles*, **60**, 628-641

DiPietro, L., and Stachenfeld, N.S. (2006) The myth of the female athlete triad. *British Journal of Sports Medicine*, **40**, 6, 490-493

Dowson, J. and Henderson, L. (2001) The validity of a short version of the Body Shape Questionnaire. *Psychiatric Research*, **102**, 3, 263-271

Eisenberg, M.E., Berge, J.M., Fulkerson, J.A. and Neumark-Sztainer, D. (2011) Weight comments by family and significant others in young adulthood. *Body Image*, **8**, 12-19

Ferguson, C.J., Winegard, B. and Winegard, B.M. (2011) Who is the fairest one of all? How evolution guides peer and media influences on female body dissatisfaction. *Review of General Psychology*, **15**, 1, 11-28

Filaire, E., Rouveix, M., Panafieux, C. and Ferrand, C. (2007) Eating attitudes, perfectionism and body-esteem of elite male judoists and cyclists. *Journal of Sports Science and Medicine*, **6,** 50-57

Frick, A., Bächtiger, M.T. and Reips, U.D. (2001) Financial incentives, personal information and dropout rate in online studies. *Current Internet Science*. Retrieved August 16th, 2011 from http://www.psychologie.uzh.ch/sowi/reips/books/tband99/pdfs/a_h/frick.pdf

Furnham, A. and Greaves, N. (1994) Gender and locus of control correlates of body image dissatisfaction. *European Journal of Personality*, **8**, 3, 183-200

Gallagher, Ting & Palmer, (2008) A journey into the unknown; taking the fear out of structural equation modeling with AMOS for the first-time user. *The Marketing Review*, **8**, 3, 255-275

Galli, N. and Reel, J.J. (2009) Adonis or Hephaestus? Exploring body image in male athletes. *Psychology of Men and Masculinity*, **10**, 2, 95-108

Ghaderi, A. and Scott, B. (2000) The Big Five and eating disorders: A prospective study in the general population. *The European Journal of Personality*, **14**, 311-323

Ginsberg, R.L. and Gray, J.J. (2006) The differential depiction of female athletes in judged and non-judged sport magazines. *Body Image*, **3**, 365-373

Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., & Gough, H. C. (2006). The International Personality Item Pool and the future of public-domain personality measures. *Journal of Research in Personality*, **40**, 84-96

Grogan, S. (2010) Promoting positive body image in males and females: Contemporary issues and future directions. *Sex Roles*, **63**, 757-765

Greenleaf, C. (2004) Weight pressures and social physique anxiety among collegiate synchronized skaters. *Journal of Sport Behaviour*, **27**, 3, 260-276

Grilo, C.M., Wilfley, D.E., Brownell, K.D. and Rodin, J. (1994) Teasing, body image and self-esteem in a clinical sample of obese women. *Addictive Behaviors*, **19**, 4, 443-450

Hahn-Smith, A.M. and Smith, J.E. (2001) The positive influence of maternal identification on body image, eating attitudes, and self-esteem of Hispanic and Anglo girls. *International Journal of Eating Disorders*, **29**, 4, 429-440

Haines, J., Neumark-Sztainer, D., Eisenberg, M.E. and Hannan, P.J. (2006) Weight teasing and disordered eating behaviors in adolescents: longitudinal findings from Project EAT (Eating Among Teens). *Pediatrics*, **117**, 2, 209-215

Harris, M.B. (2000) Weight concern, body image and abnormal eating in college women tennis players and their coaches. *International Journal of Sports Nutrition and Exercise Metabolism*, **10**, 1, 1-15

Hausenblaus, H.A. and Symons Downs, D. (2001) Comparison of body image between athletes and nonathletes: A meta-analytic review. *Journal of Applied Sport Psychology*, **13**, 323-339

Hausenblas, H.A. and McNally, K.D. (2004) Eating disorder prevalence and symptoms for track and field athletes and nonathletes. *Journal of Applied Sport Psychology*, **16**, 3, 274-286

Helfert, S. and Warschburger, P. (2011) A prospective study on the impact of peer and parental pressure on body dissatisfaction in adolescent girls and boys. *Body Image*, **8**, 101-109

Hildebrant, T., Alfano, L. and Langenbucher, J.W. (2010) Body image disturbance in 1000 male appearance and performance enhancing drug users. *Journal of Psychiatric Research*, **44**, 13, 841-846

Karazsia, B. T. (2007). *Family and Peer Influences on Exercise Scale*. Unpublished

measure, Kent State University, Kent, OH.

Keery, H., Boutelle, K., van den Berg, P. and Thompson, J.K. (2005) The impact of appearance-related teasing by family members. *Journal of Adolescent Health*, **37**, 2, 120-127

Kian, E.M. and Clavio, G. (2011) A comparison of online media and traditional newspaper coverage of the men's and women's U.S. Open tennis tournaments. *Journal of Sports Media*, **6**, 1

Kline, R.B. (2011) Principles and Practice of Structural Equation Modeling, Third Edition. New York, New York: Guilford. pp

Klinkowski, N., Korte, A., Pfeiffer, E., Lehmkuhl, U. and Salbach-Andrae, H. (2008) Psychopathology in elite rhythmic gymnasts and anorexia nervosa patients. *European Child & Adolescent Psychiatry*, **17**, 2, 108-113

Kluck, A.S. (2010) Family influence on disordered eating: The role of body image dissatisfaction. *Body Image*, **7**, 8-14

Krane, V., Stiles-Shipley, J.A., Waldron, J. and Michalenok, J. (2001) Relationships among body satisfaction, social physique anxiety and eating behaviours in female athletes and exercisers. *Journal of Sport Behavior*, **24**, 3, 247-264

Krentz, E.M. and Warschburger, P. (2011) Sports-related correlates of disordered eating in aesthetic sports. *Psychology of Sport and Exercise*, **12**, 4, 375-382

Kvalem, I.L., von Soest, T., Roald, H.E. and Skolleborg, K.C. (2006) The interplay of personality and negative comments about appearance in predicting body image. *Body Image*, **3**, 263-273

Langdon, S.W. and Petracca, G. (2010) Tiny dancer: Body image and dancer identity in female modern dancers. *Body Image*, **7**, 4, 360-363

Levenson, H. (1972). Distinctions within the concept of internal–external control: Development of a new scale. *Proceedings of the 80th Annual Convention of the American Psychological Association* (pp. 261–262).

Lowery, S.E., Kurpius, S.E.R., Befort, C., Blanks, E.H., Sollenberger, S. Nicpon, M.F. and Huser, L. (2005) Body image, self-esteem, and health-related behaviors among male and female first year college students. *Journal of College Student Development*, **46**, 6, 612-623

Manfreda, K.L. and Vehovar, V. (2003) Survey design features influencing response rates in web surveys. Retrieved August 16th, 2011 from http://scholar.googleusercontent.com/scholar?q=cache:MWrqvvFBm1oJ:scholar.google.com/+questionnaire+length+%2B+drop+out&hl=en&as_sdt=0,5

Martinsen, M., Bratland-Sanda, S., Eriksson, A.K. and Sundgot-Borgen, J. (2010) Dieting to win or to be thin? A study of dieting and disordered eating among adolescent elite athletes and non-athlete controls. *British Journal of Sports Medicine*, **44**, 1, 70-76

McVey, G.L., Kirsh, G., Maker, D., Walker, K.S., Mullane, J., Laliberte, M., Ellis-Claypool, J., Vorderbrugge, J., Burnett, A., Cheung, L. and Banks, L. (2010) Promoting positive body image among university students: A collaborative pilot study. *Body Image*, **7**, 200-204

Miller, J.L., Schmidt, L.A., Vaillancourt, T., McDougall, P. and Laliberte, M. (2006) Neuroticism and introversion: A risky combination for disordered eating among a non-clinical sample of undergraduate women. *Eating Behaviors*, **7**, 69–78

Neumark-Sztainer, D. (2005) Preventing the broad spectrum of weight-related problems: Working with parents to help teens achieve a healthy weight and a positive body image. *Journal of Nutrition Education and Behavior*, **37**, suppl 2, 133-140

Parke, R. D., and Buriel, R. (2008). Socialization in the family: Ethnic and ecological perspectives. In W. Damon & R. M. Lerner (Eds.), Child and adolescent development: An advanced course (pp. 95–138). Hoboken, NJ: John Wiley & Sons.

Pricard, C.L. (1999) The level of competition as a factor for the development of eating disorders in female collegiate athletes. *Journal of Youth and Adolescence*, **28**, 5, 583-594

Price, B.R. and Pettijohn, T.F. (2006) The effect of ballet dance attire on body and self perceptions of female dancers. *Social Behavior and Personality: An international journal*, **34**, 8, 991-998

Petrie, T.A., Greenleaf, C., Reel, J.J. and Carter, J.E. (2009) An examination of psychosocial correlates of eating disorders among female collegiate athletes. *Research Quarterly for Exercise and Sport*, **80**, 3, 621-632

Reel, J.J. and Gill, D.L. (1996) Psychosocial factors related to eating disorders among high school and college female cheerleaders. *The Sport Psychologist*, **10**, 2, 195-206

Reinking, M.F. and Alexander, L.E. (2005) Prevalence of disordered-eating behaviors in undergraduate female collegiate athletes and nonathletes. *Journal of Athletic Training*, **40**, 1, 47-51

Richman, E.L. and Shaffer, D.R. (2000) "If you let me play sports" How Might Sport Participation Influence the Self-Esteem of Adolescent Females? *Psychology of Women Quarterly*, **24**, 2, 189-199

Rosenberg, M. (1965). *Society and adolescent child.* Princeton, NJ: Princeton University Press.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monograph*, **80**, 1–28.

Russell, K.M. (2004) On versus off the pitch: The transiency of body satisfaction among female rugby players, cricketers, and netballers. *Sex Roles*, **59**, 9-10, 561-574

Savalei, V. (2010) The relationship between RMSEA and model misspecification in CFA models. Unpublished manuscript. Retrieved on 12th August, 2011, from http://www2.psych.ubc.ca/~vsavalei/myarticles/Savalei%20RMSEA%202009.pdf

Schutz, H.K., Paxton, S.J. and Wertheim, E.H. (2002) Investigation of body comparison among adolescent girls. *Journal of Applied Social Psychology*, **32**, 9, 1906-1 937

Scoffier, S., Maiano, C. and d'Arripe-Longueville, F. (2010) The effects of social relationships and acceptance on disturbed eating attitudes in elite adolescent female athletes: The mediating role of physical self-perceptions. *International Journal of Eating Disorders*, **43**, 1, 65-71

Scoffier, S., Paquet, Y. and d'Arripe-Longueville, F. (2010) Effect of locus of control on disordered eating in athletes: The mediational role of self-regulation of eating attitudes. *Eating Behaviors*, **11**, 3, 164-169

Sheets, V. and Ajmere, K. (2005) Are romantic partners a source of college students' weight concern? *Eating Behaviors*, **6**, 1, 1-9

Steinfeldt, J.A., Carter, H., Benton, E. and Steinfeldt, M.C. (2011) Muscularity beliefs of female college student-athletes. *Sex Roles*, **64**, 7-8, 543-554

Stormer, S.M. and Thompson, J.K. (1996) Explanations of body image disturbance: A test of maturational status, negative verbal commentary, social comparison and sociocultural hypotheses. *International Journal of Eating Disorders*, **19**, 2, 193-202

Sudi, K., Öttl, K., Payerl, D., Baumgartl, P., Tauschmann, K. and Müller, W. (2004) Anorexia Athletica. *Nutrition*, **20**, 7-8, 657-661

Sundgot-Borgen, J. (1994) Risk and trigger factors for the development of eating disorders in female elite athletes. *Medicine and Science in Sports and Exercise*, **26**, 4, 414-419

Swami, V., Hadji-Michael, M. and Furnham, A. (2008) Personality and individual difference correlates of positive body image. *Body Image*, **5**, 3, 322-325

Thompson, J.K., Fabian, L.J., Moulton, D.O., Dunn, M.E. and Altabe, M.N. (1991) Development and validation of the Physical Appearance Related Teasing Scale. *Journal of Personality Assessment*, **56**, 3, 513-521

Thomsen, S.R., Bower, D.W. and Barnes, M.D. (2004) Photographic images in women's health, fitness, and sports magazines and the physical self-concept of a group of adolescent female volleyball players. *Journal of Sport and Social Issues*, **28**, 3, 266-283

Vicario, T. and Chambliss, C. (2001) The benefits associated with dance education for adolescent girls. Retrieved 14th May, 2011, from http://eric.ed.gov/ERICWebPortal/search/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED448404&ERICExtSearch_SearchType_0=no&accno=ED448404

Wood-Barcalow, N.L., Tylka, T.L. and Augustus-Horvath, C.L. (2010) "But I Like My Body": Positive body image characteristics and a holistic model for young-adult women. *Body Image*, **7**, 2,106, 116

World Health Organization (2011) BMI Classification. Retrieved August, 13, 2011, from http://apps.who.int/bmi/index.jsp?introPage=intro_3.html

Appendix A means and standard deviations of measures

Scale	Mean	SD
Age	25.07	8.12
BMI	22.32	3.45
BSQ	47.72	18.68
Neuroticism	59.15	15.29
Extraversion	68.8	14.82
Openness	76.35	11.5
Agreeableness	75.58	10.89
Conscientiousness	72.47	12.91
Self-esteem	33.54	5.16
Internal LoC	31.62	5.85
Powerfully others LoC	20.85	7.44
Chance LoC	20.80	7.4
PARTS	29.24	12.68
Social comparisons	10.05	3.41

Appendix B Sport, sport type and number of participants

Sport	Type	Number of participants
Archery	Non-aesthetic	0
Athletics	Non-aesthetic	5
Badminton	Non-aesthetic	10
Basketball	Non-aesthetic	0
Boxing	Non-aesthetic	3
Cheerleading	Aesthetic	36
Cricket	Non-aesthetic	0
Curling	Non-aesthetic	0
Dance	Aesthetic	54
Diving	Non-aesthetic	3
Equestrian	Non-aesthetic	2
Fencing	Non-aesthetic	0
Figure skating	Aesthetic	1
Football	Non-aesthetic	1
Golf	Non-aesthetic	1
Gymnastics	Aesthetic	26
Hockey	Non-aesthetic	2
Ice hockey	Non-aesthetic	0
Lacrosse	Non-aesthetic	0
Martial arts	Non-aesthetic	6
Netball	Non-aesthetic	7
Rugby	Non-aesthetic	0
Rugby football	Non-aesthetic	0

Roller derby	Non-aesthetic	0
Sailing	Non-aesthetic	2
Squash	Non-aesthetic	4
Shinty	Non-aesthetic	0
Swimming	Non-aesthetic	26
Synchronised swimming	Aesthetic	0
Tennis	Non-aesthetic	8
Trampolining	Aesthetic	5
Volleyball	Non-aesthetic	2

Appendix C Additional sports and non-sport exercise reported by participants

Sport	Type	Number of participants
Aerial Acrobatics	Aesthetic	1
Aerobics	Non-aesthetic	1
Body Balance/Body Combat/Body Pump	Non-aesthetic	3
Circuit training	Non-aesthetic	2
Climbing	Non-aesthetic	3
Cross training	Non-aesthetic	1
Cycling	Non-aesthetic	12
Gym	Non-aesthetic	10
Hill walking	Non-aesthetic	1
Jogging	Non-aesthetic	4
Kettlesize	Non-aesthetic	1
Long distance walking	Non-aesthetic	1
Nordic pole walking	Non-aesthetic	1
Nordic skiing	Non-aesthetic	1
Orienteering	Non-aesthetic	1
Pole dancing	Aesthetic	2
Running	Non-aesthetic	22
Rowing	Non-aesthetic	1
Softball	Non-aesthetic	1
Tai Chi	Aesthetic	1
Marathon running	Non-aesthetic	1
Weight training	Non-aesthetic	2

Zumba	Non-aesthetic	7
Yoga	Aesthetic	3

Appendix D full questionnaire used in study

Body image in sports

Thank you for agreeing to participate in this study on positive body image in sports. You have been asked to participate because you are female and over the age of 18, if you do not meet this criteria, please do not proceed with the questionnaire.

You will be asked to complete several scales measuring psychological and sociocultural factors believed to be related to body image as well as information on what sports you regularly participate in. This study is part of an MSc in Individual Differences at the University of Edinburgh and has received ethical approval from the University of Edinburgh Psychology Research Ethics Committee. There are no known risks or benefits for you in participating in this study.

This study should take no more than 30 minutes to complete. You have the right to withdraw from the study at any time without explanation by simply closing your browser. If, at any point, you wish to have your data removed from the study, please email [redacted] with the date you completed your survey and your date of birth. You have the right to omit or refuse to respond to any question, without penalty. Your participation in this study is voluntary. However, you will be given the opportunity to enter a prize draw for gift vouchers on completion of this study.

No personal data will be taken from you during this study and researchers will not be able to identify you from any of your responses. This study is completely confidential.

If you require any further details on this study, you may contact [redacted] at [redacted] or the project's supervisor, [redacted].

1 Sex:

Please choose **only one** of the following:

- ○Female
- ○Male

2 Date of birth:

Please enter a date:

3 Please enter below your current highest level of education:

Please choose **only one** of the following:

- ○High school
- ○Some University
- ○College qualification (ie HCN/HND)

- ○ Undergraduate degree (BSc etc)
- ○ Postgraduate study (eg MSc)
- ○ PhD

4 Please enter your BMI in the box below. For help calculating your BMI, please copy and paste the link below into a separate window, this will direct you to a calculator tool.

Please write your answer here:

www.bbc.co.uk/health/tools/bmi_calculator/bmi.shtml

5 Sports

This section asks you to indicate what, if any, sports you participate in regularly.

Please tick below all sports you participate in regularly.

Please choose **all** that apply:

- ☐ Archery
- ☐ Athletics
- ☐ Badminton
- ☐ Basketball
- ☐ Boxing
- ☐ Cheerleading
- ☐ Cricket
- ☐ Curling
- ☐ Dance
- ☐ Diving
- ☐ Equestrian
- ☐ Fencing
- ☐ Figure skating
- ☐ Football
- ☐ Golf
- ☐ Gymnastics

- ☐ Hockey
- ☐ Ice hockey
- ☐ Lacrosse
- ☐ Martial arts
- ☐ Netball
- ☐ Rugby
- ☐ Rugby football
- ☐ Roller derby
- ☐ Sailing
- ☐ Squash
- ☐ Shinty
- ☐ Swimming
- ☐ Synchronised swimming
- ☐ Tennis
- ☐ Trampolining
- ☐ Volleyball

6 If you regularly participate in any sports which did not appear in the list below, please add them here:

Please write your answer here:

7 Please list the highest level you are participating in (if you have ticked more than one sport, please answer for your main sport):

Please choose **only one** of the following:

- ○ Recreational only.
- ○ Competition at local or regional level.
- ○ National-level competition.
- ○ International competition.
- ○ Professional.

8 At what age did you start participating in this sport (again, if you have indicated more than one sport please choose your main sport)?

Please write your answer here:

9 If you do not participate in sports, but do exercise on a regular basis, please give details of activities below:

Please write your answer here:

10 BSQ

We would like to know how you have been feeling about your appearance over the past two weeks.

Please read each question carefully and answer.

Please choose the appropriate response for each item:

	Never	Rarely	Sometimes	Often	Very often	Always
Have you been so worried about your shape that you have been feeling that you ought to diet?	○	○	○	○	○	○
Has being with thin people made you feel self-conscious about your shape?	○	○	○	○	○	○
Have you ever noticed the shape of other people and felt that your own shape compared unfavourably?	○	○	○	○	○	○
Has being undressed, such as	○	○	○	○	○	○

	Never	Rarely	Sometimes	Often	Very often	Always
when taking a bath, made you feel fat?						
Has eating sweets, cakes or other high calorie food made you feel fat?	○	○	○	○	○	○
Have you felt excessively large and rounded?	○	○	○	○	○	○
Have you felt ashamed of your body?	○	○	○	○	○	○
Has worry about your shape made you diet?	○	○	○	○	○	○
Have you thought that you are the shape you are because you lack self-control?	○	○	○	○	○	○
Have you worried about other people seeing rolls of fat around your waist and stomach?	○	○	○	○	○	○
Have you felt that it is not fair that other people are thinner than you?	○	○	○	○	○	○
Has seeing your reflection e.g. in a mirror or shop window made you feel bad about your shape?	○	○	○	○	○	○

	Never	Rarely	Sometimes	Often	Very often	Always
Have you been particularly self-conscious about your shape when in the company of other people?	○	○	○	○	○	○
Has worry about your shape made you feel you ought to exercise?	○	○	○	○	○	○

11 NEO Personality

This section contains statements concerning your personality. Read each statement carefully and answer honestly. For each statement select the answer which applies to you generally.

Please choose the appropriate response for each item:

	Very innacurate	Moderately innacurate	Neither accurate nor inaccurate	Moderately accurate	Very accurate
Often feel blue.	○	○	○	○	○
Have a good word for everyone.	○	○	○	○	○
Am always prepared.	○	○	○	○	○
Feel comfortable around people.	○	○	○	○	○
Believe in the importance of art.	○	○	○	○	○
Seldom feel blue.	○	○	○	○	○
Have little to say.	○	○	○	○	○
Am not interested in abstract ideas.	○	○	○	○	○
Have a sharp tongue.	○	○	○	○	○

	Very innacurate	Moderately innacurate	Neither accurate nor inaccurate	Moderately accurate	Very accurate
Waste my time.	○	○	○	○	○
Dislike myself.	○	○	○	○	○
Believe that others have good intentions.	○	○	○	○	○
Pay attention to details.	○	○	○	○	○
Make friends easily.	○	○	○	○	○
Have a vivid imagination.	○	○	○	○	○
Feel comfortable with myself.	○	○	○	○	○
Keep in the background.	○	○	○	○	○
Do not like art.	○	○	○	○	○
Cut others to pieces.	○	○	○	○	○
Find it difficult to get down to work.	○	○	○	○	○
Am often down in the dumps.	○	○	○	○	○
Respect others.	○	○	○	○	○
Get chores done right away.	○	○	○	○	○
Am skilled in handling social situations.	○	○	○	○	○
Tend to vote for liberal political candidates.	○	○	○	○	○

	Very innacurate	Moderately innacurate	Neither accurate nor inaccurate	Moderately accurate	Very accurate
Rarely get irritated.	○	○	○	○	○
Would describe my experiences as somewhat dull.	○	○	○	○	○
Avoid philosophical discussions.	○	○	○	○	○
Suspect hidden motives in others.	○	○	○	○	○
Do just enough work to get by.	○	○	○	○	○
Have frequent mood swings.	○	○	○	○	○
Accept people as they are.	○	○	○	○	○
Carry out my plans.	○	○	○	○	○
Am the life of the party.	○	○	○	○	○
Carry the conversation to a higher level.	○	○	○	○	○
Am not easily bothered by things.	○	○	○	○	○
Don't like to draw attention to myself.	○	○	○	○	○
Do not enjoy going to art museums.	○	○	○	○	○
Get back at others.	○	○	○	○	○
Don't see things through.	○	○	○	○	○

	Very innacurate	Moderately innacurate	Neither accurate nor inaccurate	Moderately accurate	Very accurate
Panic easily.	○	○	○	○	○
Make people feel at ease.	○	○	○	○	○
Make plans and stick to them.	○	○	○	○	○
Know how to captivate people.	○	○	○	○	○
Enjoy hearing new ideas.	○	○	○	○	○
Am very pleased with myself.	○	○	○	○	○
Don't talk a lot.	○	○	○	○	○
Tend to vote for conservative political candidates.	○	○	○	○	○
Insult people.	○	○	○	○	○
Shirk my duties.	○	○	○	○	○
Am filled with doubts about things.	○	○	○	○	○
Am concerned about others.	○	○	○	○	○
Complete tasks successfully.	○	○	○	○	○
Start conversations.	○	○	○	○	○
Enjoy thinking about things.	○	○	○	○	○
Am relaxed most of the time.	○	○	○	○	○

	Very innacurate	Moderately innacurate	Neither accurate nor inaccurate	Moderately accurate	Very accurate
Avoid contact with others.	○	○	○	○	○
Do not like poetry.	○	○	○	○	○
Believe that I am better than others.	○	○	○	○	○
Mess things up.	○	○	○	○	○
Feel threatened easily.	○	○	○	○	○
Trust what people say.	○	○	○	○	○
Do things according to a plan.	○	○	○	○	○
Warm up quickly to others.	○	○	○	○	○
Can say things beautifully.	○	○	○	○	○
Seldom get mad.	○	○	○	○	○
Am hard to get to know.	○	○	○	○	○
Rarely look for a deeper meaning in things.	○	○	○	○	○
Contradict others.	○	○	○	○	○
Leave things unfinished.	○	○	○	○	○
Get stressed out easily.	○	○	○	○	○
Sympathize with	○	○	○	○	○

	Very innacurate	Moderately innacurate	Neither accurate nor inaccurate	Moderately accurate	Very accurate
others' feelings.					
Am exacting in my work.	○	○	○	○	○
Talk to a lot of different people at parties.	○	○	○	○	○
Enjoy wild flights of fantasy.	○	○	○	○	○
Am not easily frustrated.	○	○	○	○	○
Retreat from others.	○	○	○	○	○
Believe that too much tax money goes to support artists.	○	○	○	○	○
Make demands on others.	○	○	○	○	○
Don't put my mind on the task at hand.	○	○	○	○	○
Fear for the worst.	○	○	○	○	○
Am easy to satisfy.	○	○	○	○	○
Finish what I start.	○	○	○	○	○
Don't mind being the center of attention.	○	○	○	○	○
Get excited by new ideas.	○	○	○	○	○
Remain calm under pressure.	○	○	○	○	○

	Very innacurate	Moderately innacurate	Neither accurate nor inaccurate	Moderately accurate	Very accurate
Find it difficult to approach others.	○	○	○	○	○
Am not interested in theoretical discussions.	○	○	○	○	○
Hold a grudge.	○	○	○	○	○
Make a mess of things.	○	○	○	○	○
Worry about things.	○	○	○	○	○
Treat all people equally.	○	○	○	○	○
Follow through with my plans.	○	○	○	○	○
Cheer people up.	○	○	○	○	○
Have a rich vocabulary.	○	○	○	○	○
Rarely lose my composure.	○	○	○	○	○
Keep others at a distance.	○	○	○	○	○
Have difficulty understanding abstract ideas.	○	○	○	○	○
Am out for my own personal gain.	○	○	○	○	○
Need a push to get started.	○	○	○	○	○

12 LoC

Please read the following questions carefully and answer honestly.

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
Whether or not I get to be a leader depends mostly on my ability.	○	○	○	○	○	○
To a great extent my life is controlled by accidental happenings.	○	○	○	○	○	○
I feel like what happens in my life is mostly determined by powerful people.	○	○	○	○	○	○
Whether or not I get into a car accident depends mostly on how good a driver I am.	○	○	○	○	○	○
When I make plans, I am almost certain to make them work.	○	○	○	○	○	○
Often there is no chance of protecting my personal interests from bad luck happenings.	○	○	○	○	○	○
When I get what I want, it's usually because I'm lucky.	○	○	○	○	○	○

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
Although I might have good ability, I will not be given leadership responsibility without appealing to those in positions of power.	○	○	○	○	○	○
How many friends I have depends on how nice a person I am.	○	○	○	○	○	○
I have often found that what is going to happen will happen.	○	○	○	○	○	○
My life is chiefly controlled by powerful others.	○	○	○	○	○	○
Whether or not I get into a car accident is mostly a matter of luck.	○	○	○	○	○	○
People like myself have very little chance of protecting our personal interests when they conflict with those of strong pressure groups.	○	○	○	○	○	○
It's not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad	○	○	○	○	○	○

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
fortune.						
Getting what I want requires pleasing those people above me.	○	○	○	○	○	○
Whether or not I get to be a leader depends on whether I'm lucky enough to be in the right place at the right time.	○	○	○	○	○	○
If important people were to decide they didn't like me, I probably wouldn't make many friends.	○	○	○	○	○	○
I can pretty much determine what will happen in my life.	○	○	○	○	○	○
I am usually able to protect my personal interests.	○	○	○	○	○	○
Whether or not I get into a car accident depends mostly on the other driver.	○	○	○	○	○	○
When I get what I want, it's usually because I worked hard for it.	○	○	○	○	○	○
In order to have my plans work, I make sure that	○	○	○	○	○	○

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
they fit in with the desires of people who have power over me.						
My life is determined by my own actions.	○	○	○	○	○	○
It's chiefly a matter of fate whether or not I have a few friends or many friends.	○	○	○	○	○	○

13 SE

Please read these questions carefully and answer honestly.

Please choose the appropriate response for each item:

	Strongly disagree	Disagree	Agree	Strongly agree
On the whole, I am satisfied with myself.	○	○	○	○
At times I think I am no good at all.	○	○	○	○
I feel that I have a number of good qualities.	○	○	○	○
I am able to do things as well as most other people.	○	○	○	○
I feel I do not have much to be proud of.	○	○	○	○
I certainly feel I am useless at times	○	○	○	○
I feel that I am a person of worth, at least on an equal plane with others.	○	○	○	○
I wish I could have more respect for myself.	○	○	○	○

	Strongly disagree	Disagree	Agree	Strongly agree
All in all, I am inclined to feel that I am a failure.	○	○	○	○
I take a positive attitude towards myself.	○	○	○	○

14 FFS

Thinking back to when you were growing up (and now if you still live at home), which of these statements are true and which are false concerning your family and friend's attitudes towards diet and exercise.

If you do not or did not live with any of these family members, leave the answer blank.

Please choose the appropriate response for each item:

	True	False	NA
My mother/main female caregiver dieted to lose weight or to control her weight.	○	○	○
My mother/main female caregiver currently diets to lose weight or to maintain her weight.	○	○	○
My mother/main female caregiver lifts weights or exercises to improve her appearance.	○	○	○
My mother/main female caregiver has encouraged me to diet to lose weight or to control my weight.	○	○	○
My mother/main female caregiver has encouraged me to lift weights or exercise to improve my appearance.	○	○	○
My mother/main female caregiver has encouraged me to lift weights or exercise to improve my fitness or athletic ability.	○	○	○
My father/main male caregiver dieted to lose weight or to control his weight.	○	○	○
My father/main male caregiver currently diets to lose weight or to maintain his weight.	○	○	○
My father/main male caregiver lifts weights or exercises to	○	○	○

	True	False	NA
improve his appearance.			
My father/main male caregiver has encouraged me to diet to lose weight or to control my weight.	○	○	○
My father/main male caregiver has encouraged me to lift weights or exercise to improve my appearance.	○	○	○
My father/main male caregiver has encouraged me to lift weights or exercise to improve my fitness or athletic ability.	○	○	○
My female sibling(s) dieted to lose weight or to maintain her weight.	○	○	○
My female sibling(s) currently diets to lose weight or to maintain her weight.	○	○	○
My female sibling(s) lift weights or exercises to improve her appearance.	○	○	○
My female sibling(s) encouraged me to diet to lose weight or maintain my weight.	○	○	○
My female sibling(s) encouraged me to lift weights or exercise to improve my appearance.	○	○	○
My female sibling(s) encouraged me to lift weights or exercise to improve my fitness or athletic ability.	○	○	○
My male sibling(s) dieted to lose weight or to maintain his weight.	○	○	○
My male sibling(s) currently diets to lose weight or to maintain his weight.	○	○	○
My male sibling(s) lift weights or exercises to improve his appearance.	○	○	○
My male sibling(s) encouraged me to diet to lose weight or maintain my weight.	○	○	○
My male sibling(s) encouraged me to lift weights or exercise to improve my appearance.	○	○	○
My male sibling(s) encouraged me to lift weights or	○	○	○

	True	False	NA
exercise to improve my fitness or athletic ability.			

15 This section asks you questions about your friends' dieting and exercise behaviours.

Please choose the appropriate response for each item:

	True	False
Some of my close friends are currently dieting to lose weight or to control their weight.	○	○
In the past, some of my close friends have dieted to lose weight or to control their weight.	○	○
My close friends are currently lifting weights or exercising to lose weight or control their weight.	○	○
In the past, some of my close friends have lifted weights or exercised to lose weight or to control their weight.	○	○
My close friends have suggested I diet to lose weight or to control my weight.	○	○
My close friends have suggested I lift weights or exercise to improve my appearance.	○	○
My close friends have suggested I lift weights or exercise to improve my fitness or athletic ability.	○	○

16 Please read the following statements and answer honestly.

Please choose the appropriate response for each item:

	Never	Almost never	Sometimes	Often	Always
I would describe myself as someone who compares her body with those of others.	○	○	○	○	○
Comparing my body with others has made me feel as if	○	○	○	○	○

	Never	Almost never	Sometimes	Often	Always
maybe I ought to diet.					
Comparing my body with others had led me to actually begin dieting.	○	○	○	○	○

17 PARTS

This section will ask you about appearance-related teasing you may have experienced as a child.

Please read the following questions carefully and answer honestly.

Please choose the appropriate response for each item:

	1 - Never	2	3	4	5 - Frequently
When you were a child, did you feel that your peers were staring at you because you were overweight?	○	○	○	○	○
When you were a child, did you ever feel like people were making fun of you because of your weight?	○	○	○	○	○
Were you ridiculed as a child for being overweight?	○	○	○	○	○
When you were a child, did people make jokes about your being too big?	○	○	○	○	○
When you were a child, were you laughed at for trying out for sports becvause you were too heavy?	○	○	○	○	○
Did your brother(s) or other male relatives call you names like "fatso" when they got angry at you?	○	○	○	○	○
Did your father ever make jokes that referred to your weight?	○	○	○	○	○
Did kids ever call you derogatory names that related to your size or weight?	○	○	○	○	○

	1 - Never	2	3	4	5 - Frequently
Did you ever feel like people were pointing at you because of your size or weight?	○	○	○	○	○
Were you the brunt of family jokes because of your weight?	○	○	○	○	○
Did people point you out of a crowd because of your weight?	○	○	○	○	○
Did you ever hear your class snicker when you walked into the classroom alone?	○	○	○	○	○
When you were growing up, did people say you dressed funny?	○	○	○	○	○
Did people say you had funny teeth?	○	○	○	○	○
Did kids call you funny looking?	○	○	○	○	○
Did other kids tease you for wearing clothes that didn't match or that were out of style?	○	○	○	○	○
Did other kids ever make jokes about your hair?	○	○	○	○	○
When you were a child were you scoffed at for looking like a weakling?	○	○	○	○	○

Thank you

Thank you for participating in the study, your contribution is valued.

If you would like any more information on this research, or would like details of the results of the study, please add your email address in the box below:

Please write your answer here:

If you would like to be entered into the prize draw to win £50 amazon vouchers, please enter your email into the box below:

Please write your answer here:

Appendix E Bivariate correlations for psychological variables

Correlations

		BSQ	N	E	O	A	C	SE	Locus of Control	LoCP	LoCC
BSQ	Pearson Correlation	1	.423**	-.042	-.022	-.108	-.064	-.482**	.120	.244**	.196*
	Sig. (2-tailed)		.000	.624	.795	.201	.452	.000	.154	.003	.020
	N	142	142	142	142	142	142	141	142	142	142
N	Pearson Correlation	.423**	1	-.370**	-.120	-.408**	-.250**	-.675**	-.083	.307**	.295**
	Sig. (2-tailed)	.000		.000	.153	.000	.003	.000	.328	.000	.000
	N	142	142	142	142	142	142	141	142	142	142
E	Pearson Correlation	-.042	-.370**	1	.230**	.147	.217**	.397**	.303**	-.163	-.134
	Sig. (2-tailed)	.624	.000		.006	.081	.009	.000	.000	.052	.111
	N	142	142	142	142	142	142	141	142	142	142
O	Pearson Correlation	-.022	-.120	.230**	1	.160	.188*	.108	.151	-.203*	-.089
	Sig. (2-tailed)	.795	.153	.006		.057	.025	.202	.074	.016	.293
	N	142	142	142	142	142	142	141	142	142	142
A	Pearson Correlation	-.108	-.408**	.147	.160	1	.301**	.073	.008	-.254**	.059
	Sig. (2-tailed)	.201	.000	.081	.057		.000	.388	.929	.002	.489
	N	142	142	142	142	142	142	141	142	142	142
C	Pearson Correlation	-.064	-.250**	.217**	.188*	.301**	1	.200*	.298**	-.161	-.323**
	Sig. (2-tailed)	.452	.003	.009	.025	.000		.018	.000	.056	.000
	N	142	142	142	142	142	142	141	142	142	142
SE	Pearson Correlation	-.482**	-.675**	.397**	.108	.073	.200*	1	.181*	-.399**	-.456**
	Sig. (2-tailed)	.000	.000	.000	.202	.388	.018		.032	.000	.000
	N	141	141	141	141	141	141	141	141	141	141
Locus of Control	Pearson Correlation	.120	-.083	.303**	.151	.008	.298**	.181*	1	-.147	-.312**
	Sig. (2-tailed)	.154	.328	.000	.074	.929	.000	.032		.081	.000
	N	142	142	142	142	142	142	141	142	142	142
LoCP	Pearson Correlation	.244**	.307**	-.163	-.203*	-.254**	-.161	-.399**	-.147	1	.472**
	Sig. (2-tailed)	.003	.000	.052	.016	.002	.056	.000	.081		.000
	N	142	142	142	142	142	142	141	142	142	142
LoCC	Pearson Correlation	.196*	.295**	-.134	-.089	.059	-.323**	-.456**	-.312**	.472**	1
	Sig. (2-tailed)	.020	.000	.111	.293	.489	.000	.000	.000	.000	
	N	142	142	142	142	142	142	141	142	142	142

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix F Bivariate correlations for sociocultural variables

Correlations

		BSQ	PARTS	SocialComp	ParentB	ParentE	SiblingB	SiblingE	FamilyZ
BSQ	Pearson Correlation	1	.399**	.846**	.245**	.302**	.107	.116	.248**
	Sig. (2-tailed)		.000	.000	.003	.000	.203	.169	.003
	N	142	137	138	142	142	142	142	142
PARTS	Pearson Correlation	.399**	1	.361**	.317**	.328**	.194*	.169*	.337**
	Sig. (2-tailed)	.000		.000	.000	.000	.023	.049	.000
	N	137	137	136	137	137	137	137	137
SocialComp	Pearson Correlation	.846**	.361**	1	.260**	.302**	.091	.056	.232**
	Sig. (2-tailed)	.000	.000		.002	.000	.287	.513	.006
	N	138	136	138	138	138	138	138	138
ParentB	Pearson Correlation	.245**	.317**	.260**	1	.609**	.308**	.268**	.709**
	Sig. (2-tailed)	.003	.000	.002		.000	.000	.001	.000
	N	142	137	138	142	142	142	142	142
ParentE	Pearson Correlation	.302**	.328**	.302**	.609**	1	.303**	.374**	.735**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000
	N	142	137	138	142	142	142	142	142
SiblingB	Pearson Correlation	.107	.194*	.091	.308**	.303**	1	.873**	.815**
	Sig. (2-tailed)	.203	.023	.287	.000	.000		.000	.000
	N	142	137	138	142	142	142	142	142
SiblingE	Pearson Correlation	.116	.169*	.056	.268**	.374**	.873**	1	.819**
	Sig. (2-tailed)	.169	.049	.513	.001	.000	.000		.000
	N	142	137	138	142	142	142	142	142
FamilyZ	Pearson Correlation	.248**	.337**	.232**	.709**	.735**	.815**	.819**	1
	Sig. (2-tailed)	.003	.000	.006	.000	.000	.000	.000	
	N	142	137	138	142	142	142	142	142

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix G Bivariate correlations for sports-related variables

Correlations

		BSQ	Age	BMI	Adult Sport	Adult Sport Level	Age Sport Began	Sport Years	Sports Yes or NO
BSQ	Pearson Correlation	1	-.190*	.294**	.108	.127	.026	-.149	.015
	Sig. (2-tailed)		.024	.003	.199	.131	.786	.122	.860
	N	142	142	99	142	142	110	109	142
Age	Pearson Correlation	-.190*	1	.302**	-.150	-.194*	.160	.741**	.093
	Sig. (2-tailed)	.024		.002	.075	.021	.095	.000	.270
	N	142	142	99	142	142	110	109	142
BMI	Pearson Correlation	.294**	.302**	1	-.138	-.115	-.097	.406**	.005
	Sig. (2-tailed)	.003	.002		.173	.259	.405	.000	.962
	N	99	99	99	99	99	76	75	99
AdultSport	Pearson Correlation	.108	-.150	-.138	1	.597**	-.124	-.257**	.748**
	Sig. (2-tailed)	.199	.075	.173		.000	.198	.007	.000
	N	142	142	99	142	142	110	109	142
AdultSportLevel	Pearson Correlation	.127	-.194*	-.115	.597**	1	-.065	-.219*	.388**
	Sig. (2-tailed)	.131	.021	.259	.000		.502	.022	.000
	N	142	142	99	142	142	110	109	142
AgeSportBegan	Pearson Correlation	.026	.160	-.097	-.124	-.065	1	-.518**	.[a]
	Sig. (2-tailed)	.786	.095	.405	.198	.502		.000	.000
	N	110	110	76	110	110	110	109	110
SportYears	Pearson Correlation	-.149	.741**	.406**	-.257**	-.219*	-.518**	1	.[a]
	Sig. (2-tailed)	.122	.000	.000	.007	.022	.000		.000
	N	109	109	75	109	109	109	109	109
SportsYesorNO	Pearson Correlation	.015	.093	.005	.748**	.388**	.[a]	.[a]	1
	Sig. (2-tailed)	.860	.270	.962	.000	.000	.000	.000	
	N	142	142	99	142	142	110	109	142

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

a. Cannot be computed because at least one of the variables is constant.